SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-46

Name: Gateway Pond **County:** Pennington

Legal description: Sec. 18, T2N, R9E
Location from nearest town: inside Ellsworth Airforce Base
Dates of present survey: June 18 & September 18, 2013
Date last surveyed: June 5-6, 2010
Management classification: Warm-water permanent

Primary Species: (game and forage)
1. Redear Sunfish
2. Largemouth Bass
3. Bluegill
4. Black Crappie

Secondary and other species:
1. Sunfish Hybrids
2. Green Sunfish
3. Yellow Perch
4. Black Bullhead
5. Golden Shiner

PHYSICAL CHARACTERISTICS

Surface Area: 5.5 acres **Watershed:** NA
Maximum depth: NA **Mean depth:** NA
Lake elevation at survey (from known benchmark): NA

Ownership of lake and adjacent lakeshore property:

The dam structure and surrounding property lies within Ellsworth Airforce Base and is owned by the United States Airforce.

Fishing Access

Gateway Pond is located within the Ellsworth Airforce Base. There are paved roads going directly to or near the pond. Shoreline angling is possible around much of the pond. However, submergent vegetation may become issue for shore anglers during the later summer months.

Observations of Water Quality and Aquatic Vegetation

Gateway Pond had submergent vegetation along the shorelines at the time of the survey. There was also emergent vegetation (mostly cattails) around a portion of the pond. No apparent water quality issues were observed at the time of the survey.

Observations on conditions of structures (i.e. spillway, boat ramps and docks, roads, etc.)

No structural issues were observed at the time of the survey. Renovations of the dam and outlet structure were completed in 2006 and 2007. Gateway Pond was also dredged during the renovations as well.

MANAGEMENT OBJECTIVES

Objective 1. To provide a unique Redear Sunfish fishery as they are found only in the Ellsworth Airforce Base ponds (Bandit, Gateway, and Heritage) west of the Missouri River.

Objective 2. Manage Gateway Pond as a panfish/Largemouth Bass fishery.

BIOLOGICAL DATA

Sampling Effort and Catch

Trap Net Survey

A trap net survey was conducted in Gateway Pond on June 18, 2013. A total of four trap nets set over-night were used to survey the fishery (Figure1). Trap nets were modified fyke nets consisting of a 1.3 X 1.5 m frame, 19.1 mm (0.75 in) mesh and a 1.2 X 23 m (3.9 X 75.5 ft) lead.

A total of 688 fish including seven species and various sunfish hybrids were collected (Table 1). These species include Redear Sunfish, Bluegill, Green Sunfish, Black Crappie, Yellow Perch, Black Bullhead, and Golden Shiner (Table 1). Gateway Pond has increased from five species in 2007, to eight species in 2010 and 2013.

Figure 1. Map of trap net locations on Gateway Pond, June 17-18, 2013.

Table 1. Catch data from all species collected in eight trap nets in Gateway Pond, Pennington County, June 18, 2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* ≥ S values with 95% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	*Wr* ≥ S
Redear Sunfish	83	20.8 (11.4)	20.8 (11.4)	94 (5)	0	99.5 (0.1)
Bluegill	564	141 (57.6)	141 (52.7)	43 (5)	0	85.4 (2.8)
Sunfish Hybrid	15	3.8 (2.0)	--	--	--	--
Green Sunfish	4	1.0 (0.7)	1.0 (0.7)	25 (75)	0	92.3 (11.1)
Black Crappie	17	4.3 (4.0)	4.3 (4.0)	0	0	82.7 (1.4)
Yellow Perch	2	0.5 (0.5)	0.5 (0.5)	50 (50)	0	87.1 (22.5)
Golden Shiner	1	0.3 (0.4)	0.3 (0.4)	--	--	--
Black Bullhead	2	0.5 (0.5)	0.5 (0.5)	100	50 (50)	117.7 (139.4)

Redear Sunfish

Redear Sunfish were stocked into Gateway Pond in 2004, and they have been found in all four trap net surveys since. Of the four trap net surveys the catch-per-unit-effort (CPUE) was the highest in 2007 at 42.8, followed by 2013 at 20.8 (Tables 1 and 2). The size structure was much larger in 2013 with a proportional stock density (PSD) of 94 (Table 2).

The 2005 survey showed the original adult Redear Sunfish stocked in the pond (Figure 2). In 2007, there was a large year-class just over stock length (100 mm) which likely shows a successful spawn, and a large portion of the fish recruited to the population (Figure 2). A smaller sample of Redear Sunfish was collected in 2010 with at least a couple of year-classes present (Figure 2). The 2013 survey revealed a large year-class with most of the fish being over quality length (180 mm) (Figure 5). There was not much sign of recruitment in 2013. Condition for Redear Sunfish has remained good during the past eight years with a mean *Wr* ≥S of 99.5 being the lowest (Table 2). Redear Sunfish that were aged ranged from age-4 through age-6 with the largest portion of the fish being age-6 (Table 3).

Table 2. Composite listing of data for Redear Sunfish collected by trap nets in Gateway Pond, 2005-2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and Wr with 95% confidence intervals in parentheses.

Year	N	CPUE	CPUE-S	PSD	PSD-P	*Wr* ≥ S
2005	35	8.8 (4.2)	8.8 (4.2)	77 (15)	0	108.2 (1.1)
2007	171	42.8 (12.7)	42 (12.5)	12 (5)	1 (1)	105 (6.8)
2010	39	19.5 (44.6)	19.5 (44.6)	54 (16)	0	130.5 (14.9)
2013	83	20.8 (11.4)	20.8 (11.4)	94 (5)	0	99.5 (0.1)

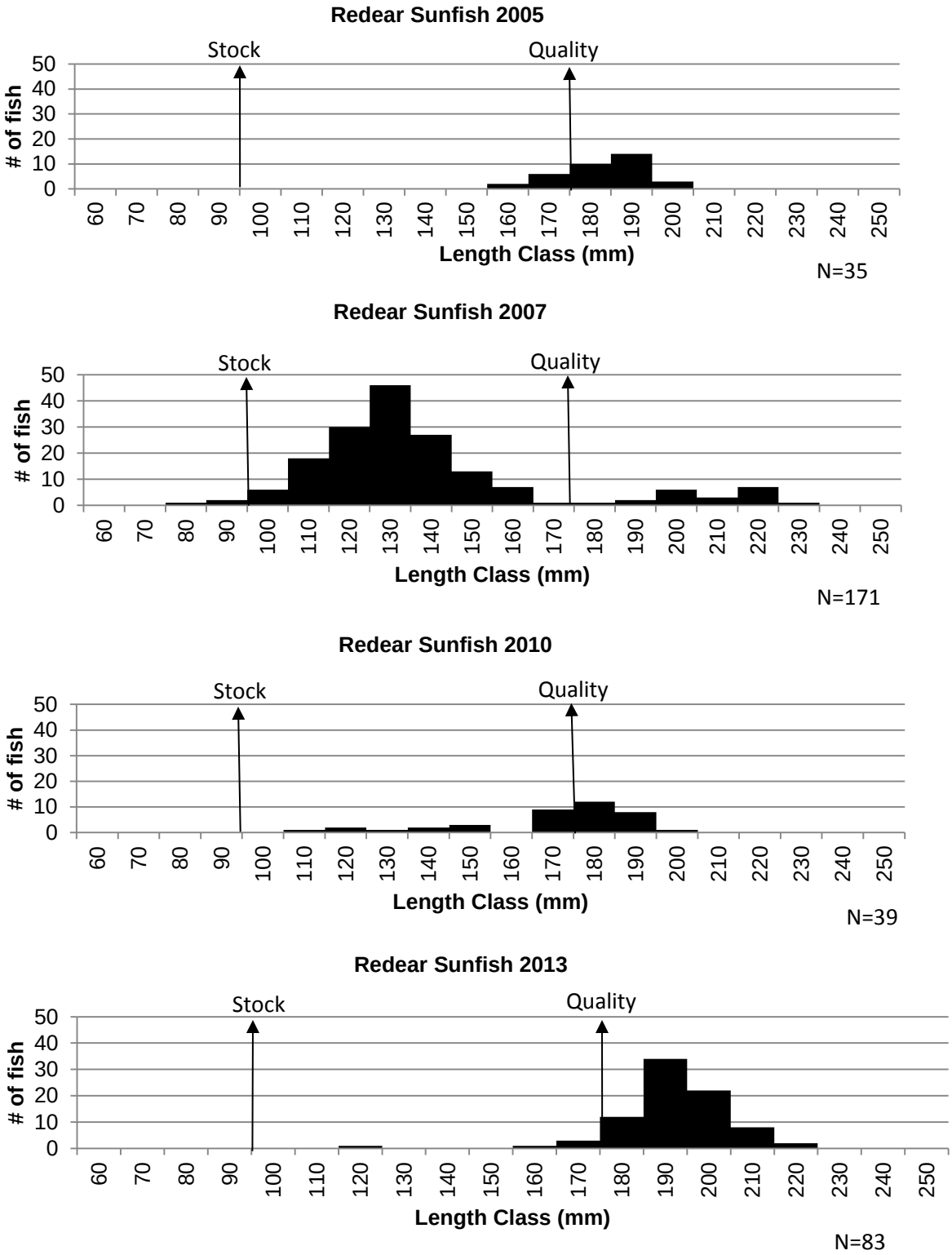

Figure 2. Length frequency histogram for Redear sunfish collected by trap nets in Gateway Pond in 2005, 2007, 2010, and 2013.

Table 3. Redear Sunfish age and minimum, maximum, and mean lengths (mm) at age at time of capture during the 2013 trap net survey of Gateway Pond.

Age	N	Min. Length	Mean Length	Max. Length
4	7	195	195	195
5	35	163	192	201
6	40	182	203	221

Bluegill

Bluegill were first found in the trap net survey in 2007. They were the most abundant fish species collected during the 2013 survey with a CPUE of 141 (Table 1). Since 2007, the population size structure has stayed similar with the majority of the fish being around quality length (150 mm; 6 in) (Figure 3). PSD was 43 for Bluegill in 2013 and *Wr* for Bluegill greater than stock length in 2013 was 85.4 (Table 1).

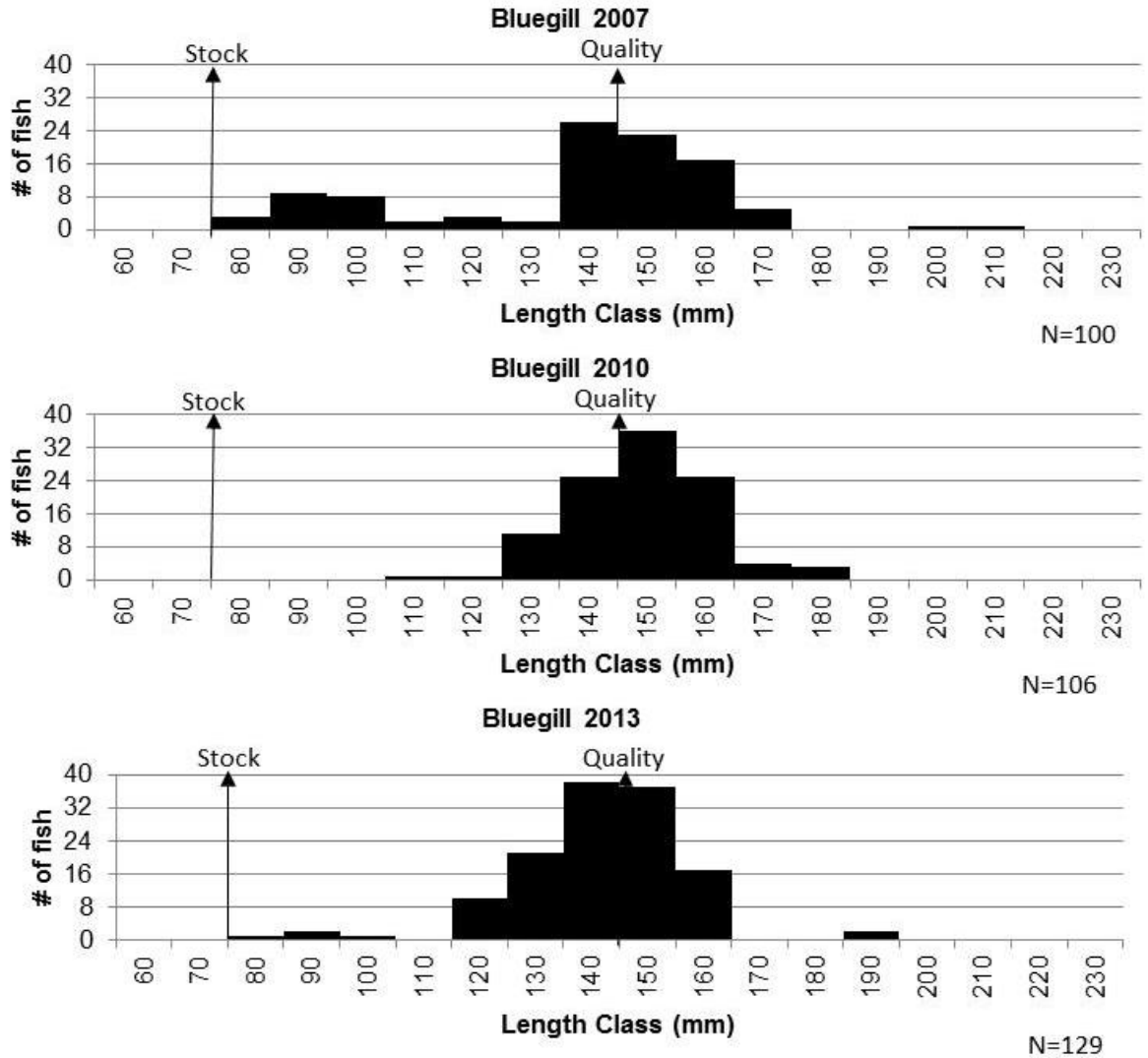

Figure 3. Length frequencies for Bluegill in Gateway Pond in 2007, 2008 and 2013.

Green sunfish

Green Sunfish have been found in Gateway Pond at a low abundance with two fish collected in 2007, none in 2010, and four in 2013. However, there were several hybrid fish collected in each of the three surveys. Some of those fish appeared to be Bluegill X Green Sunfish. The CPUE was one and the PSD was 25 for Green Sunfish collected in the trap nets in 2013 (Table 1).

Sunfish Hybrids

Hybrid sunfish were discovered the first year (2007) in which multiple sunfish species were found in the survey. In 2013, a total of 15 sunfish hybrids were collected with a mean CPUE of 3.8 (Table 1). The hybrids appeared to be combinations of Bluegill X Redear Sunfish and Bluegill X Green Sunfish. However, SDGF&P personnel combined them together and referred to them all as sunfish hybrids.

Black Crappie

Black Crappies were first found during the 2010 trap net survey with a CPUE of four. In 2013, a total of 17 were collected with a mean CPUE of 4.3 (Table 1). All of the Black Crappies collected in 2010 and 2013 were under quality length (200 mm; 8 in). The mean *Wr* for Black Crappies greater than stock length (130 mm; 5 in) was 82.7 (Table 1).

Other Species

Black Bullheads (N=2) and Golden Shiner (N=1) were also collected during the 2013 survey. Golden Shiners were found in the 2010 survey as well. This was the first survey that Black Bullheads were found. Both of the Black Bullheads were large with one being over quality length (230 mm; 9 in) and the other over preferred length (300 mm; 12 in).

Electrofishing Survey

Largemouth bass

A night electrofishing survey of Gateway Pond was conducted on September 18, 2013 to evaluate the Largemouth Bass population. The survey consisted of three electrofishing passes totaling 328 seconds.The electrofishing survey was conducted shortly after stocking 100 pelvic fin clipped adult Largemouth Bass to estimate the population. A total of 36 Largemouth Bass were collected during the survey. Of the 36 collected 18 were marked with a pelvic fin clip. Using the Petersen single census population estimate this equates to 196 (CI=160-231) Largemouth Bass (Table 4).

The PSD and PSD-P for Largemouth Bass collected by electrofishing was 19 and 13, respectively (Table 4). Condition of the fish was good with a mean *Wr* $\geq$S of 96.5 (Table 1). These parameters include the newly stocked fish. A variety of sizes were collected during the survey with a large portion of the Largemouth Bass being between stock (200 mm; 8 in) and quality (300 mm; 12 in) length (Figure 9). Most of the stocked fished were in that size range. There were several fish collected over preferred (380 mm;15 in) length as well (Figure 4).

Table 4.. Catch data for Largemouth Bass collected during night electrofishing at Gateway Pond, Pennington County, September 18, 2013. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and Wr with 95% confidence intervals in parentheses.

N	CPUE (80%)	CPUE-S (80%)	PSD (95%)	PSD-P (95%)	*Wr* ≥ S (95%)	Pop. Est. (80%)
36	408 (529.8)	368.6 (508.1)	19 (14)	13 (12)	96.5 (2)	196 (160-231)

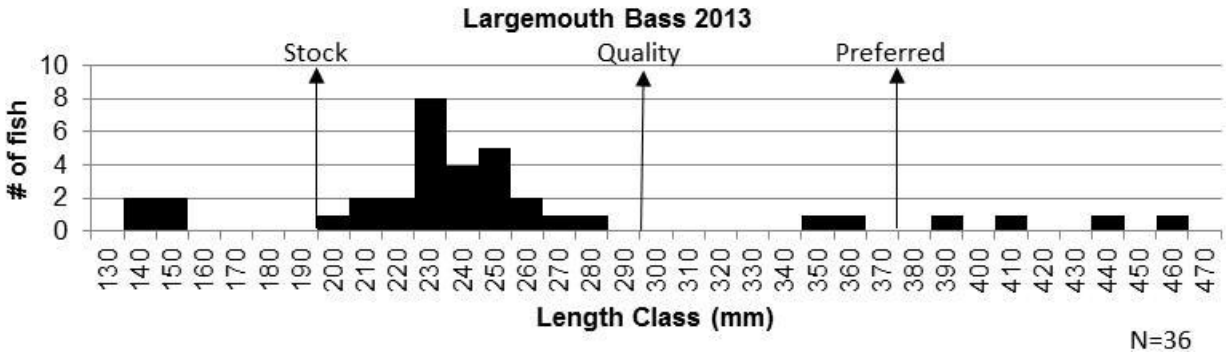

Figure 4. Length frequency histogram for Largemouth Bass collected by night electrofishing in Gateway in 2013.

MANAGEMENT RECOMMENDATIONS

1. Conduct an electrofishing survey within the next couple of years to evaluate the Largemouth Bass population since the last stocking.

2. Conduct a standard population check on the panfish every five years or as needed for management actions.

3. Stock adult Largemouth Bass if density continues to appear low and the panfish density continues to be high.

4. Find another pond void of other panfish species to establish as a source for Redear Sunfish.

APPENDIX

Appendix A. Gateway fish stocking records for 2004-Present.

Year	Species	Size	# Stocked
2004	Redear Sunfish	Adult	150
2004	Largemouth Bass	Fingerling	860
2013	Largemouth Bass	Adult	100